U. S. ARMY TECHNICAL CENTER FOR EXPLOSIVES SAFETY

EXPLOSIVES SAFETY

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EXPLOSIVES SAFETY WAIVERS

Quantity Distance (QD) Considerations

Minimum required separations between explosives locations and from explosives to nonexplosives locations are detailed in draft AR 385-64 , 13 August 1993, U.S. Army Explosives Safety Program and draft DAP 385-64, 13 August 1993, Ammunition and Explosives Safety Standards. These minimum separations are based on exposing nearby facilities to some acceptable level of risk from the explosives hazard.

Mission requirements may mandate the use of lesser separations and the commander's acceptance of a greater degree of risk. This acceptance is formalized in a waiver request. Approval is granted by the major Army command (MACOM) in accordance with AR 385-64 and DAP 385-64.

The decision facing commanders in submitting and approving waivers is whether the mission needs justify the increase in risk, a damage assessment, impact on mission capability, compensatory measures, and waiver elimination actions.

The Department of Defense (DOD) and Army explosives safety guidelines require that waivers be based on compelling mission requirements, not on operational convenience. The justification must provide specific mission requirements that cannot be met unless the application of reduced distances is approved. Where other alternatives exist, such as reducing or removing the explosives at a location, or moving the exposed site, reasons must be specific and include why the alternatives are unacceptable.

When commanders request or approve a waiver, they have decided the mission needs outweigh the additional risk resulting from reduced QD separations. Trained personnel can assist in estimating the risk involved by estimating the type and degree of damage to facilities, equipment and personnel exposed to waivered explosives locations. The staff must use the standards to predict the impact of an accident on mission capability. Unless the assessment process is thorough, the commander may lack information essential to ensure the waiver is justified.

Waivers are temporary violations of QD and, in most instances, have a specific plan for corrective actions. Waivers without corrective action should not be allowed. To ensure corrective action progresses, a review process is necessary, All levels involved in the waiver process, both commanders and staff, must consider the hazards of waivered situations and assign priorities to construction projects, equipment funding, and so on.

Several current QD separation requirements are substantially less than the somewhat conservative standards of a few years ago. Therefore, most waivers of today's DOD standards pose substantial, or sometimes unacceptable, levels of additional risk. Our failure to accurately assess the level and need of the additional risk and weigh the impact against the justification could result in an unacceptable loss. This must be avoided.

The commander's staff plays an important role in advising and assisting the command to establish an acceptable balance between safety and operational necessity. The Army explosives safety program development includes training to assure personnel can and do participate in the waiver preparation and assessment process at all levels. The DA Hazard Analysis for Explosives and Ammunition Operations Course is provided at the U. S. Army Defense Ammunition Center and School (USADACS). The U.S. Army Technical Center for Explosives Safety (USATCES) is available to assist in both the waiver preparation and risk assessment.

Tenants

The Army Safety Office recently replied to a MACOM inquiry providing clarification and rationale for the current explosives safety waiver processing policy as stated in AR 385-64. It applies to the processing of waiver requests for tenant units of one MACOM for deviating activity occurring on the installation of another MACOM. The policy restates the Army emphasis on correction of deviating situations and is pertinent for all Army elements in similar situations.

Explosives safety waivers requested by units of one MACOM, tenant on the installation of another MACOM, require review and recommendation for approval by the tenant unit commander through the MACOM level. The host installation MACOM commander exercises final approval authority for any short-term deviating situation planned or existing on installations assigned to that MACOM.

The installation commander has overall responsibility for assuring explosives safety throughout his installation. Explosives safety responsibility follows the host installation chain of command above the installation level. Tenants must comply with host installation policies and procedures in this area.

Review by the tenant unit chain of command assures that:

- The tenant unit's chain of command is actually aware of and supports the tenant unit action even though it deviates from Army explosives safety policy and the situation meets the essentiality criteria of the draft AR 385-64. The tenant unit chain may choose to direct discontinuance of deviating activity instead of supporting the waiver.

- The tenant unit's MACOM is provided the opportunity to apply its assets, as opposed to those of the host MACOM, to eliminate the situation which causes the need for deviation from Army explosives safety guidance. This could consist of the initiation of a corrective MCA project, the reprioritization of an existing MCA project which could eliminate the deviating situation or the modification/reassignment of the mission requiring the deviation.

Final review/approval by the host MACOM commander assures that the host chain of command is afforded the opportunity to fix the situation after the tenant unit's MACOM has been unable to fix it. Confirmation of the essentiality of the deviating situation by the tenant unit chain of command should suffice as justification for the need to perform the mission in the described manner.

by: Mr. John C. Willut
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HAZARD CLASSIFICATION BY PREDOMINANT HAZARD

A hazard class is a United Nations (UN) designator to identify a material. There are 9 classes. Class 1 is explosive and Class 2 is compressed gas. The Joint Hazard Classification System (JHCS) includes only material actually containing explosives or explosives items which usually results in the material being designated as a Class 1 item. If an ammunition item, however, contains a hazardous material that presents a greater hazard for transportation than the Class 1 material, the item is assigned the hazard classification of the greater or predominant hazard.

Recent items entered into the JHCS have been Class 2 items in which the only effect external to the item would be the release of a gas such as Argon or Nitrogen. Certain pyrotechnic items are designated as Class 4 with the predominate hazard being a flammable solid. The explosive material may be of a quantity and/or configuration that, if it was activated, any explosion would be contained or would not cause significant damage or injury when compared to the predominant hazard.

Items not Class 1 by predominant hazard will have the weight of the Class 1 material entered for Net Explosives Weight (NEW), Net Propellant Weight (NPW), or both as applicable. The Net Explosives Weight for Quantity Distance (NEWQD) will be 0.0.

The Storage Compatibility Group (SCG) for the Department of Defense (DOD) hazard classification will be included in the JHCS for Non-Class 1 items. This will aid in the storage of these items. When an item is classified by predominant hazard, the assignment of SCG "S" must be verified by testing.

by: Mr. Richard Albrecht
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APPROVAL OF LOCALLY-DEVELOPED AMMUNITION SUPPORT EQUIPMENT (ASE)

The U.S. Army Defense Ammunition Center and School (USADACS) continues to prepare for accepting the responsibility for safety approval of locally developed equipment planned for expanded use for handling ammunition and explosives. Until responsibility is formalized within applicable regulations, USADACS is providing a courtesy analysis and comments/recommendations on locally developed equipment when requested.

This program will not eliminate the authority of the local commander to approve locally developed equipment for use on his own installation. This program will provide approval that permits expanded use of such equipment at other installations.

As a by-product of this effort, we will be able to provide an engineering analysis of locally developed equipment, a technical data package (TDP) with improvements when required for expansion of equipment to other installations, as well as a catalog and data base of locally developed handling equipment.

Installations can request a courtesy review of locally developed handling equipment by submitting a request with pertinent data to: Director, U.S. Army Defense Ammunition Center and School, Attn: SMCAC-DES, Savanna, IL 61074-9639.

by: Mr. Thomas J. Michels
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PMUAST UPDATE

The Joint U.S./Republic of Korea (ROK) Research, Development, and Test (RD&T) New Underground Ammunition Storage Technologies (UAST) Program which started in 1991, has generated a wealth of test data. Small-scale testing, conducted at the U.S. Army Engineer Waterways Experiment Station (USAEWES), Vicksburg, MS, Big Black River Test Site and at the Agency for Defense Development (ADD) outside Taejon, ROK was completed in early 1994.

Evaluation of the small-scale test data by both the U.S. and ROK Technical Advisory Groups (TAGs) concluded in several concept designs which offer excellent promise for significant reductions in the existing Department of Defense (DOD) criteria for hazard areas external to an underground storage site. Using the small-scale results, both the U.S. and ROK explosion effects engineers and scientists have specially designed and instrumented 1/8- through 1/3-scale underground tunnel and chamber test areas to conduct explosives tests.

The ROK is experiencing outstanding successes in their intermediate-scale testing at the Yeoncheon test site, north of Seoul. The U.S. accomplishments have come by incorporating the unique test chamber designs and tunnels in an abandoned mine outside Magdalena, NM. The combined U.S. and ROK testing programs are showing potential reductions in external hazard areas of 85 percent and greater. Internal separation of chambers and tunnels with specific design parameters for both explosives safety and ammunition logistics continues to develop to assure safe underground storage designs. The final testing phase will demonstrate large scale application and will begin in early 1995. Planning is underway for U.S. Department of Defense Explosives Safety Board (DDESB) and the ROK Ministry of National Defense (MND) Explosives Safety Management Board reviews and approvals on both the new concept designs and the associated explosives safety underground storage criteria to be developed from this joint effort.

by: Mr. Gary W. Abrisz
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CLEANUP OF ORDNANCE AND EXPLOSIVES WASTE (OEW) ON A BASE REALIGNMENT AND CLOSURE (BRAC) INSTALLATION

Installations slated for closure under BRAC should consider as early as possible the impact OEW cleanup will have on the dates parcels of installation property can be released. Experience has shown the initial OEW site characterization efforts often underestimate the degree of OEW present. Once an entity has been promised a certain piece of property by a certain date, delays caused by cleanup taking longer than expected produces strained community relations and negative publicity.

It is technically and financially impossible to remove 100 percent of all OEW from a parcel of land to be released. Residual OEW creates residual risk. To inform the installation commander, the major Army command (MACOM), HQDA, and the Department of Defense Explosives Safety Board (DDESB) of the risk and control measures, and to secure their acceptance thereof, a safety submission is required by draft AR 385-64, 13 August 1993, U.S. Army Explosives Safety Program. The U.S. Army Technical

Center for Explosives Safety (USATCES) can assist MACOMs and installations prepare these submissions.

by: Mr. Cliff Doyle
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APPROVAL OF A NEW TYPE MAGAZINE

Based on geographical constraints at Picatinny Arsenal, NJ, the U.S. Army Armament Research, Development and Engineering Center (ARDEC) commissioned the U.S. Army Engineer Division, Huntsville (USAEDH) to develop a special storage structure. The design criteria specified that the structure be reusable after detonation of its contents.

The magazine which USAEDH developed is designed to completely contain all fragments and debris if the contents are initiated. The magazine consists of a reinforced concrete cubicle with a lightweight front panel and a massive barricade to intercept the front panel. Designs are available for magazines designed for 50, 100, 200, and 300 pounds of explosives.

The Department of Defense Explosives Safety Board (DDESB) has approved this magazine for siting based on overpressure alone for Hazard Division (HD) 1.1, 1.3, and 1.4 munitions.

by: Mr. Steve Blunk
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USE OF SMALL, BATTERY POWERED ELECTRONIC DEVICES NEAR EXPLOSIVES AND AMMUNITION

The use of portable electronic devices (hand-held calculators, computers, etc) in ammunition operations is generally considered to be safe and risk-free. This is largely true because most ammunition and explosives are at low risk from the hazards presented by electronic devices. However, these devices cannot be considered safe under all conditions and users should perform a risk assessment prior to their use.

Some general guidance provided for safety personnel and others when assessing the risk of using electronic devices in the vicinity of ammunition and explosives follows.

The first hazard to consider is the possible generation of electromagnetic radiation (EMR) by the device. EMR is a hazard to munitions and explosives sensitive to initiation from electrical sources, typically those with electrical explosive devices (EEDs). Two effective ways to reduce the hazards from EMR to these items are shielding and separation by distance. This has been a common practice with portable radio transmitters such as security radios.

The second hazard is presented when electronic devices are brought into hazardous locations such as those where a flammable or combustible material is present. In these instances, the equipment must not produce electrical or thermal energy at a level which will ignite the specific hazardous atmosphere. In these instances, the facility will be rated as a hazardous location, and the only equipment to be used in these locations must be certified as safe to use in this environment.

A risk assessment must take into account: the explosives or munitions susceptible to EMR, steps taken to shield the items at risk from EMR, the distance of electronic devices being used from items with EEDs, electronic devices being used are in a hazardous location, and the rating of equipment used in the hazardous location.

by: Mr. Mike Wheless
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USE OF DEPARTMENT OF TRANSPORTATION (DOT) LABELS ON INERT LOADS

To increase realism in training, some organizations place DOT explosives labels on inert training loads. Installations should be aware that it is illegal to transport a package that bears a DOT label that does not contain a hazardous material on public roads (CFR 49, section 172.401). Further, if involved in a fire, first responders will not attempt fire suppression or rescue operations if they believe explosives are involved.

by: Mr. Greg Heles
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ELECTRICAL TESTING OF LIGHTNING PROTECTION SYSTEMS (LPS)

Some installations have LPS applications which are unique making compliance with electrical testing requirements of DAP 385-64 impractical. Guidance concerning these unique applications is contained in DAP 385-64, paragraph 12-14f. As stated in this paragraph, when strict compliance for test and inspection of a facility cannot be accommodated, installations must make use of available expertise i.e., electrical engineers, at their command to develop a reasonable, well-documented test and inspection plan utilizing the guidance contained in Chapter 12 and Appendices B and D of DAP 385-64. These plans should then be forwarded to the installation's next higher headquarters for review. Once approved, the plan should be retained in the installation's permanent records. Applications which present special challenges for use of the three point fall-of-potential method of testing are among these unique applications.

While the three point fall-of-potential method is the only Army recognized method for determining resistance to earth, certain other test instruments may suggest differing methods that are appropriate for use in these unique applications. Comparison testing of the three point fall-of-potential method and the proposed method should be included in the evaluation of the proposed alternative method. Once documented as stated above, the proposed method may be utilized.

by: Mr. Lyn Little
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The EXPLOSIVES SAFETY BULLETIN targets the ammunition/explosives community. It is printed in Savanna, Illinois. If you wish to submit an article that is of interest to the ammunition/explosives community, or if you have a request for more copies of the bulletin, please forward it to: Director, U.S. Army Technical Center for Explosives Safety, ATTN: SMCAC-ESM, Savanna, IL 61074-9639 or call us at DSN 585-8710/ COMMERCIAL (815)273-8710.

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EXPLOSIVE SAFETY INFORMATION DATA BASE (ESIDB)

Users with newer, high speed modems who are tired of logging into our system at 1200 or 2400 baud, may now log into our system at 9600 baud by dialing DSN 585-8907 (commercial 815-273-8907). This applies to people who just use the JHCS on our system as well.

We are not pulling the plug on users loging into the system at the slower speeds. Dialing DSN 585-6020 (commercial 815-273-6020) will still connect you to our system at 1200 or 2400 baud.

Complete modem settings are: baud rate, N, 8, and 1 for both phone numbers.

Other points of interest in the ESIDB are:

- There are now over 500 explosives accidents in our ESIDB.
- Production based accident data is complete back to May 1987.
- Army reported accident data is complete back to January 1990.
- Listing accidents by explosive or munitions type is explained much better now. It is easier to find accident data for certain items.
- You can see accident data reported since your last login.
- You can see accident data reported in the last 30, 90, or 180 days.

New accident data is added to the ESIDB monthly. We will be increasing the explosives weight fields soon from three to four in the JHCS. This will differentiate which value is to be used for storage and which is to be used for transportation of the item. We welcome your comments and suggestions as we continue to make enhancements to the ESIDB and the JHCS automated systems.

by: Bob Carr
Data Base Coordinator
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USATCES HOTLINE

A 24-hour HOTLINE is established to better serve the needs of the explosives/ammunition community

Callers are invited to submit any problems, comments, and suggestions to USATCES, DSN 585-6030